

From root Sat Jul 30 18:27:08 1994
Received: by tcet.unt.edu (5.61-AIX-1.2/1.0)
id AA171593 (for tapr-bb, from root/root); Sat, 30 Jul 94 18:27:08 -0500
From: root (The Super-user)
Message-Id: <9407302327.AA171593@tcet.unt.edu>
Subject: Stolen
To: tapr-bb
Date: Sat, 30 Jul 94 18:27:07 CDT
X-Mailer: ELM [version 2.4dev PL17]
Status: R0

Forwarded message:
>From cooper@cwis.unomaha.edu Sat Jul 30 08:43:42 1994
Message-Id: <9407301342.AA18330@cwis.unomaha.edu>
Subject: Stolen
To: netsig@tcet.unt.edu
Date: Sat, 30 Jul 1994 08:42:46 -0500 (CDT)
>From: Steve Cooper <cooper@cwis.unomaha.edu>
X-Mailer: ELM [version 2.4 PL21]
Content-Type: text
Content-Length: 1696

Hello TAPR,
Myself and my wife recently decided that it was time to move from my old address. The old neighborhood didn't like all the ham antennas either and when I put up the HyGain TH-11DX HF antenna they proceeded to go after me. Anyway we took everything down and sold the house. We had everything put in storage while we build a new house out in the country and we are now about 3 weeks from moving in. Last weekend while I was working RAGBRI with our local ham group someone broke into 26 of the storage units where we had everything stored. They got things besides this but this is the ham gear they got. If you find any of the gear I would appreciate it. It is stolen. I have replacement insurance and they didn't get all my gear but they did get these pieces. If anyone can put this the nation wide bbs system I would appreciate it. I am living in a one bedroom apartment until the house is done.

EQUIPMENT STOLEN:

Icom 211 2 meter all mode base station s/n 3894
with SM4 microphone unit has all the filters

Icom 735 High Frequency Base Station Rig s/n 08016
with SM6 Microphone and PS 55 Power Supply

Kenwood TR-751A SSB 2 meter Rig S/N 8080003

RF Concepts 2-117 2 meter Amplifier s/m 3085

All units have the serial numbers engraved on them along with my old address, call letters and old telephone numbers and my work phone number. They also have the information engraved on the inside bottom covers of the rigs. I would appreciate it if you could cut

and paste this message to the national system. I am sick over this.

Thanks,
Steve Cooper
NOKVC
work 402-554-2758 home 402-342-0732 (evenings)
or unocooper@applelink.apple.com or
cooper@cwis.unomaha.edu

From gjones@tenet.edu Fri Jul 22 19:43:26 1994
Received: by tcet.unt.edu (5.61-AIX-1.2/1.0) from Kay-Abernathy.tenet.edu with SMTP

id AA160294 (for tapr-bb, from gjones@tenet.edu/gjones@tenet.edu); Fri, 22 Jul 94 19:43:26 -0500

Received: (from gjones@localhost) by Kay-Abernathy.tenet.edu (8.6.9/8.6.9) id TAA17805 for tapr-bb@tcet.unt.edu; Fri, 22 Jul 1994 19:43:29 -0500

From: Greg Jones <gjones@tenet.edu>

Message-Id: <199407230043.TAA17805@Kay-Abernathy.tenet.edu>

Subject: Update: 13th ARRL Digital Communications Conference

To: tapr-bb@tcet.unt.edu (TAPR-BB mailing)

Date: Fri, 22 Jul 1994 19:43:28 -0500 (CDT)

X-Mailer: ELM [version 2.4 PL23]

Content-Type: text

Content-Length: 9092

Status: RO

>From: ESTEY@SKYLER.MAVD.HONEYWELL.COM

Date: Fri, 22 Jul 1994 19:31:17 -0500 (CDT)

ARRL 13th ANNUAL DIGITAL COMMUNICATIONS CONFERENCE AUGUST 19-21

Do you operate a Digital mode (maybe Pactor, Packet, GTOR or AMTOR) now?

Do you find it difficult to keep up with the latest Digital technology?

Would you like to know more about Digital modes?

If you answered "yes" to any of these questions, then you should attend the 13th Annual ARRL Digital Communications Conference. Read on ...

The Conference will be held on August 19 - 21, 1994 at the Thunderbird Convention Center, 2201 East 78th Street in Bloomington, Minnesota.

Accommodations are available at the adjacent Thunderbird Hotel, at the many Hotels and Motels located within a short distance, and also at several area RV/camper campgrounds.

Enjoy a weekend of fun learning about the latest developments in TCP/IP, PACTOR, AMTOR, PACTOR-II, CLOVER, G-TOR, PACKET, DSP, and imaging. Participate in the nine forums about DSP, new HF modes, TCP/IP, VHF/UHF networking, BBS SYSOP issues and more. A glance at the program (attached) will show many forums that will catch your interest!

*** NEWS FLASH ***

BEGINNER'S FORUM ADDED TO FRIDAY CONFERENCE AGENDA

If you are a newcomer to Digital Communications and feel somewhat intimidated by all of the technical "jargon", then the Friday Evening Beginner's Forum is just the thing for you. Veteran instructor John Kaplan, WR0W, will present a "crash" course from 7-9:30 PM to help you feel more comfortable in the Saturday technical forums and discussions. There is no extra cost for this forum - its included in the main registration fee. Space is limited so register now!

One of the highlights of the conference will be the presentation of 18 technical papers on the many aspects of digital communications throughout the day on Saturday. A list of papers is attached. You will receive a copy of all papers presented.

Many demonstrations of the latest in hardware and software will be presented. When you leave, you will have an in-depth understanding of the latest digital communications advancements and techniques. The Saturday evening Technical Showcase will feature TAPR Special Interest Group meetings for BBS SYSOPs and on VHF/UHF network building and a nearly-mathless presentation of the design and implementation of DSP software for a high-performance HF DSP modem based on the \$99 TI DSK DSP evaluation module by Johan Forrer, KC7WW.

The Hospitality Room will provide the place to meet old friends ... and make new ones. At the Saturday luncheon you will get to know "who's who" in digital communications. Meet the Engineering staff of manufacturers like Kantronics and Timewave Technologies. The optional Saturday evening diner will provide another opportunity to make new friends.

If you want a break from the Conference, the Mall of America, with hundreds of unique stores, is located within easy walking distance. Your family will enjoy Knott's Camp Snoopy theme park inside the Mall. The renowned Minnesota Zoo is only a short drive away.

The Conference registration fee is \$45 per person, which includes admission to all Conference activities, a luncheon buffet and a copy of the technical papers. An optional Saturday evening buffet is \$20 per person additional. Registration deadline is August 12th.

For more information about the Conference or special Airline and Motel discounts call or write:

ARRL Digital Communications Conference
 C/O Paul Ramey WG0G
 16266 Finland Avenue
 Rosemount, MN 55068
 Packet: WG0G@WA0CQG.#MSP.MN.USA.NA
 Telephone: (612) 432-1640
 Internet: PRAMEY@RAM.NET

The host organization for the 1994 ARRL Digital Communications Conference is the TwinsLAN Amateur Radio Club.

See YOU at the Digital Communications Conference August 19-21!

13th ANNUAL ARRL DIGITAL COMMUNICATIONS CONFERENCE
PRELIMINARY PROGRAM

Friday, August 19

TIME	ROOM	EVENT
Noon - 6	PM	TBD ARRL "Future Modes" Committee meeting.
Noon - 6	PM	TBD ARRL "219-MHz" Committee meeting.
4 - 10	PM	Menominee Conference check-in.
6 PM - 11	PM	Menominee Hospitality & Demo area open

Saturday, August 20

TIME	ROOM	EVENT
6:30 -	Noon	Menominee Hospitality & Demo area open
7:00 -	Noon	Menominee Conference Check-in.
8:00 -	8:15 AM	Miami Conference "Welcome"
8:30 -	10:00 AM	Miami Technical Paper Presentation
8:30 -	10:00 AM	Yakima Forum - Developments in DSP For the Amateur.
8:30 -	10:00 AM	Shoshone Forum - TCP/IP - What's next?
10:00 -	10:15 AM	All Break
10:15 -	11:45 AM	Miami Technical Paper Presentation
10:15 -	11:45 AM	Yakima Forum - ARRL Committee Updates: "Future Modes": Moderator - Paul Rinaldo W4RI and "219-MHz Networking": Moderator - Tod Olson K0T0"
10:15 -	11:45 AM	Shoshone Forum - Digital Data (Voice and Image) Transmission Method Developments.
11:45 -	Noon	All Break
Noon -	1:00 PM	Miami Buffet Luncheon (Included)
1:00 -	5:30 PM	Menominee Hospitality & Demo area open
1:15 -	2:45 PM	Miami Technical Paper Presentation
1:15 -	2:45 PM	Yakima Forum - High-Speed (above 1200 baud) data transfer methods and networking techniques.
1:15 -	2:45 PM	Shoshone Forum - HF Data Transmission Methods - An Over-view of Current Modes and What's Coming Next.
2:45 -	3:00 PM	All Break
3:00 -	4:30 PM	All Continuation of all sessions
5:30 -	6:30 PM	Miami Buffet Diner (Optional)
7:00 -	11:00 PM	Menominee Hospitality & Demo area open
7:00 -	10:00 PM	Miami Tucson Amateur Packet Radio (TAPR) Presents Special

Interest Groups:

- Packet BBS SYSOPs
- VHF/UHF Network Building

7:00 - 10:00 PM Yakima American Digital Radio
Society (ADRS)presents a
technical presentation:
"A Low Cost DSP Modem for HF Digital
Experimentation" by
Johan Forrer, KC7WW

Sunday, August 21

TIME	ROOM	EVENT
8:30 -	Noon	Menominee Hospitality & Demo area open
10:00 -	11:00	Menominee Conference wrap-up and close.

13th ARRL Digital Communications Conference Proceedings

1. A Proposal for a Standard Digital Radio Interface
Written by Jeffrey Austen, K9JA
2. Automatic Packet Reporting System (APRS)
Written by Bob Bruninga, WB4APR; Presented by Gwyn Reedy, W1BEL
3. Broadcast, UI and un-connected protocols-the future of Amateur Packet
Radio?
Written and Presented by Paul Evans, W4/G4BKI
4. Packet, GPS, APRS and the Future
Written and Presented by Paul Evans, W4/G4BKI
5. Computer Networks in Africa: From Utopian Discourse to Working Reality
Written by Iain Cook
6. A Low Cost DSP Modem for HF Digital Experimentation
Written and Presented by Johan Forrer, KC7WW
7. G-TOR: The Protocol
Written by Mike Huslig, Phil Anderson, Karl Medcalf and Glenn Prescott
Presented by Karl Medcalf and Mike Huslig.
8. GMON-a G-TOR Monitoring Program for PC Compatibles
Written by Richard Huslig and Phil Anderson, W0XI; Presented by Phil
Anderson.
9. A Theoretical Evaluation of the G-TOR Hybrid ARQ Protocol
Written by Glenn E. Prescott, WB0SKX, And Phil Anderson, W0XI;
Presented by Glenn Prescott
10. On Fractal Compression of Images for Narrowband Channels and Storage
W. Kinsner, VE4WK

11. Fast CELP Algorithm and Implementation for Speech Compression
A. Langi, VE4ARM, W. Grieder, VE4WSG, and W. Kinsner, VE4WK
12. Wavelet Compression for Image Transmission Through Bandlimited Channels
A. Langi, VE4ARM, and W. Kinsner, VE4WK
13. ROSE X.25 Packet Switch Status Update
Thomas A. Moulton, W2VY
14. A Primer on Reliability as Applied to Amateur Radio Packet Networks
T.C. McDermott, N5EG
15. FSK Modem with Scalable Baud Rate
Wolf-Henning Rech, N1EOW, and Gunter Jost, KD7WJ
16. MacAPRS: Mac Automatic Packet Reporting System-A Macintosh Version of APRS
Keith Sproul, WU2Z, and Mark Sproul, KB2ICI
17. Formation of the TAPR Bulletin Board System Special Interest Group
David A. Wolf, W05H
18. How Amateur Radio Operators Can Emulate an HF ALE Radio
David R. Wortendyke, N0WGC
19. A Preview of HF Packet Radio Modem Protocol Performance
Teresa Young, Stephen Rieman, David Wortendyke, N0WGC

Rev. 7/22/94

From gjones@tenet.edu Wed Jul 13 12:47:54 1994
Received: by tcet.unt.edu (5.61-AIX-1.2/1.0) from Kay-Abernathy.tenet.edu with SMTP
id AA155957 (for tapr-bb, from gjones@tenet.edu/gjones@tenet.edu); Wed, 13 Jul 94 12:47:54 -0500
Received: (from gjones@localhost) by Kay-Abernathy.tenet.edu (8.6.7/8.6.6) id MAA01377 for tapr-bb@tcet.unt.edu; Wed, 13 Jul 1994 12:48:01 -0500
From: Greg Jones <gjones@tenet.edu>
Message-Id: <199407131748.MAA01377@Kay-Abernathy.tenet.edu>
Subject: DSP-93 Announcement
To: tapr-bb@tcet.unt.edu (TAPR-BB mailing)
Date: Wed, 13 Jul 1994 12:48:00 -0500 (CDT)
X-Mailer: ELM [version 2.4 PL23]
Content-Type: text
Content-Length: 11474
Status: RO

NEWS: Announcement of DSP-93 kit

Tucson Amateur Packet Radio

July 12th, 1994

DSP-93

The TAPR/AMSAT Joint DSP Program

Announcement of Kit Sales

In July 1988, TAPR and AMSAT entered into the Joint DSP Program, in order to fund the development of an eventual DSP unit for amateur usage. As of the 1993 Dayton Hamvention, the direction of development was focused on a modular, standalone DSP system proposed by Bob Stricklin, N5BRG, in Dallas, Texas. The Stricklin KISS design, later renamed DSP-93, offered many of the things that the initial design goals of the project had specified. Fifteen months after the decision was made to proceed with the DSP-93 development, TAPR and AMSAT are both proud to announce that orders for kits will be taking place July 15th through August 31st for the first 150 units. The DSP-93 will be supplied as a complete kit (including box and power supply).

For those not wanting to build a kit, there are several preassembled DSP units on the market today. Ads for these units can be found in various publications. It is our hope that the TAPR/AMSAT joint DSP-93 project will expand the use of DSP in the amateur community and become a tool for education.

DSP-93 Design

The DSP-93 is designed to provide radio amateurs the wonderful capabilities of Digital Signal Processing in a stand-alone low-cost design. Not just limited to one mode, the DSP-93 can support data, audio, and video modes with the proper software.

DSP-93 has been designed in a modular fashion with two four-layer boards utilizing an interconnecting bus structure. The basic system includes a DSP engine board and a radio/computer interface board. The DSP Engine, bottom board, contains the TMS320C25 DSP, 32K by 16 bits of program and data memory - upgradable to 64K, the clock circuitry (40Mhz) and some programmable array logic for system I/O. The Radio/Computer Interface Board, top board, contains two eight pin female mini-DIN connectors for radio interfacing. Incoming radio signals pass through a voltage divider to establish the initial levels, then through an eight channel multiplex chip. The multiplex chip then feeds the single A/D input with either of the radio inputs or one of the six auxiliary inputs. The Texas Instruments TLC32044 Analog I/O chip is used, which samples and updates at a rate of up to 45K operations per second and includes aliasing filters. This board also communicates to your computer at speeds up to 19.2K baud using a serial connection.

The modular design of the DSP-93 allows for either of these boards to be replaced with future boards designed for any number of unique applications. It's sort of like adding a new application card to a PC without redesigning the complete PC. The block diagram shows how the DSP-93 is interfaced. (see phamplet)

Basic Software Suite

The initial offering of the DSP-93 will contain the following software: 1200 baud AFSK, 300 baud AFSK, 1200 PSK, 9600 FSK terrestrial, 9600 FSK full-duplex for satellite operations, and various audio filters. These have been developed, tested, and have been in use during alpha/beta-testing.

Software currently under test, which may or may not be released with the first batch of kits include: APT, Digital Oscilloscope, SSTV, and HF modes. User interface software for DOS and Windows is also under development and testing.

Future software will be distributed on Internet, CompuServe, Amateur Satellites, and other systems, as well as being made available on disk as part of the TAPR software library. The idea of software for the DSP-93 is to make it as easy as possible to get and upgrade software in the future. Since the DSP-93 is an open architecture, it is hoped that as more amateurs get their units, more software will be developed and distributed.

Code Development

A low cost shareware assembler is available for code development. To develop code for this board, you must have good reference material. You can find numerous books on DSP algorithms and developing DSP code. The manufacturer's data sheets and books for the complex chips will also be good reference material. All the details needed to write DSP code will be supplied with the kits.

To make this project a bigger success, more people are needed who want to learn about developing DSP applications, networking, and converting from the real linear world to the digital world. Ideally, everyone taking the challenge will select a particular idea and become so focused in the application that they become the expert. Some of the areas for development might include: new modulation techniques, speech synthesis, filters, spectrum analyzers, and many more applications you will think of. If you choose to work on the hardware aspects of this project, the modular approach should allow you to convert to other DSP chips or Analog I/O chips or to add additional capability.

Future Options

High Speed Radio Interface board is a second radio interface board with higher speed analog I/O chips. In general, its functionality is just like the Radio Interface Board, except that it contains the Burr Brown DSP101 Analog to Digital converter (used for input data) and the Burr Brown DSP201 Digital to Analog converter (used for output). The A/D chip is capable of 200K samples per second with eighteen bits of resolution and the D/A chip can attain 300K updates per second with eighteen bits accuracy. No date of release or cost set.

Network Interface board is intended to support higher speed modes which require moving large amounts of data to the computer faster than a serial port can handle. A National Semiconductor ST-NIC chip was selected for the task. The ST-NIC is working in the eight bit mode. An 8K SRAM buffer is

included for network packets. The DSP-93 will be able to read and write to all the registers of the ST-NIC. This high speed data interface will be an advantage when dealing with video applications. The ability to utilize the card in a network environment will be limited and is intended to work only at a netbios level with a very simple structured DSP protocol. The success of the network board will depend on the available DSP cycles left over between A/D samples after all tasks are completed. No date of release or cost set.

TNC Interface board can be placed inside the DSP-93 for the decoding of HDLC frames for packet radio applications. The board provides the basic functionality required of a TNC as a low-cost option for those that require one entire unit, instead of hooking their DSP-93 to an existing TNC at the station. No date of release or cost set.

Project Team

Much of the development and current success of the DSP-93 project can be contributed to the designers, developers, and testers. Designer: Bob Stricklin, N5BRG. Project Managers: Bob Stricklin, N5BRG and Greg Jones, WD5IVD. Joint DSP Project Officers: Robert Diersing, N5AHD (AMSAT) and Greg Jones, WD5IVD (TAPR). The Alpha-Team: Bob Stricklin, N5BRG, Frank Perkins, WB5IPM, Jon Bloom, KE3Z, Lon Cecil, WB5PKJ, Tom McDermott, N5EG, Robert Diersing, N5AHD, UoSAT/Doug Loughmiller, K05I/G0SYX, John Conner, WD0FHG, Greg Jones, WD5IVD, and Bill Reed, WD0ETZ. The Beta-Team: Jack Davis, WA4EJR, Paul Beckmann, WA0RSE, Scott Zehr, K9GKC, Ron Parsons, W5RKN, Jim Tittsler, 7J1AJH/AI8A, Michael Zingman, N4IRR, Stan Salek, KD6CVL, Mark Hammond, KC4EBR, Marcel Losekoot, Bill Beech, NJ7P, Gould Smith, WA4SXM, Roy Welch, W0SL, Greg Ratcliff, Brian Straup, NQ9Q, Doug Howard, KG5OA, and Robert Greenfield, VE3DSC.

Any of the project members welcome questions about their work and involvement. If you know someone on this list, please ask them about their unit and how it operates. Personal contact with testers is one of the best ways to determine the unit's possible usefulness in your shack. Many of the testers are active on the satellites and so they are easy to contact.

Ordering your Kit

The DSP-93 will sell for \$430 as a complete kit, including enclosure and power supply.

TAPR kits can be complex depending on the kitting experience of each builder. We don't think you will have trouble with the DSP-93 kit, but it does require some knowledge and experience to successfully go from a kit to a finished, usable unit, depending on the mode of operations. For data radio applications (i.e. 9600 baud FSK), special modifications must be made to your radio for proper operation of the DSP-93. Unlike other TAPR kits in the past, only the interface to the radio and the serial cable to the computer (DB-9) will be the responsibility of the kit builder. All other parts will be in the kit ready for complete assembly.

Due to the cost of each unit, TAPR and AMSAT are unable to fund the total

purchasing of inventory that may sit idle on the shelf for months. Neither organization can sustain such an investment at this time, with AMSAT Phase IIID developments and other such TAPR projects ongoing. To avoid this possibility, TAPR and AMSAT are requiring that kit purchasers provide VISA/MC information or checks/money orders with their initial purchases. Money for the initial kit purchase will be deposited on September 15th, 1994 to cover kitting costs, with kits being shipped beginning November 15th. If kits are available before November 15th, they will be shipped when available. Orders will be taken for the first 150 units. If more than 150 units are ordered, then a second or third batch will be done as soon as additional parts inventory can be purchased and kitted. In this way, the DSP-93 kit will be provided in the exact numbers required for the demand. Many of the parts in the DSP-93 are between 10-15+ weeks shipment dates and have already been ordered for delivery the end of September. After this initial kit offering, DSP-93 kits will be provided in batches as the demand warrants doing kits. The initial batch of kits will be as large as the demand requires, which we hope is large. The more the merrier!

DSP-93 orders for the initial purchase will be taken from July 15th through August 31st, 1994. Orders can be mailed to the TAPR address: 8987-309 E. Tanque Verde Rd #337, Tucson, Az, 85749-9399, call (817) 383-0000 (Office Hours: Tue-Fri, 9am-12noon, 3pm-5pm Central Time), or fax (817) 566-2544. If you have questions concerning the unit, please write or call TAPR for an information pamphlet. The pamphlet will also be made available via fax through the TAPR voice system.

Note to TAPR members: Since this is a joint project, this kit will not have a membership discount attached.

References:

Stricklin, Bob. (1994). TAPR/AMSAT Joint DSP Project: DSP-93. Proceedings of the TAPR 1994 Annual Meeting. Tucson Amateur Packet Radio Corp.

Stricklin, Bob and Greg Jones. (1993). TAPR/AMSAT DSP-93 Project. Proceedings of the 1993 AMSAT-NA. AMSAT.

Stricklin, Bob. (1993). DSP-93: The Joint DSP Program (TAPR/AMSAT). Issue #52, Fall 1993, Packet Status Register. pp. 4-5. Tucson Amateur Packet Radio Corp.

Tucson Amateur Packet Radio
8987-309 E Tanque Verde Rd #337 * Tucson, Az * 85749-9399 * 817-383-0000

From gjones@tenet.edu Mon Jul 11 05:02:27 1994
Received: by tcet.unt.edu (5.61-AIX-1.2/1.0) from Kay-Abernathy.tenet.edu with SMTP

id AA108567 (for tapr-bb, from gjones@tenet.edu/gjones@tenet.edu); Mon, 11

Jul 94 05:02:27 -0500

Received: (from gjones@localhost) by Kay-Abernathy.tenet.edu (8.6.7/8.6.6) id FAA16464 for tapr-bb@tcet.unt.edu; Mon, 11 Jul 1994 05:02:38 -0500

From: Greg Jones <gjones@tenet.edu>

Message-Id: <199407111002.FAA16464@Kay-Abernathy.tenet.edu>

Subject: Latest Info on ARRL DCC

To: tapr-bb@tcet.unt.edu (TAPR-BB mailing)

Date: Mon, 11 Jul 1994 05:02:38 -0500 (CDT)

X-Mailer: ELM [version 2.4 PL23]

Content-Type: text

Content-Length: 5685

Status: RO

According to ESTEY@SKYLER.MAVD.HONEYWELL.COM:

Date: Sun, 10 Jul 1994 15:39:44 -0500 (CDT)

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ARRL Digital Communications Conference
C/O Paul Ramey WG0G
16266 Finland Avenue
Rosemount, MN 55068
Packet: WG0G@WA0CQG.#MSP.MN.USA.NA
Telephone: (612) 432-1640

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See YOU at the Digital Communications Conference August 19-21!

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PRELIMINARY PROGRAM

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10:15 - 11:45 AM Shoshone Forum - Digital Data (Voice and Image) Transmission Method Developments.

11:45 - Noon AM All Break

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1:15 - 2:45 PM Shoshone Forum - HF Data Transmission Methods - An Over-view of Current Modes and What's Coming Next.

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3:00 - 4:30 PM All Continuation of all sessions

5:30 - 6:30 PM Miami Buffet Diner (Optional)

7:00 - 11:00 PM Menominee Hospitality & Demo area open

7:00 - 10:00 PM Miami Tucson Amateur Packet Radio (TAPR) Presents Special Interest Groups:

- Packet BBS SYSOPs
- VHF/UHF Network Building

7:00 - 10:00 PM Yakima American Digital Radio Society (ADRS)presents a technical presentation:
"Low-cost HF DSP Modems" by Johan Forrer, KC7WW

Sunday, August 21

TIME	ROOM	EVENT
8:30 -	Noon	Menominee Hospitality & Demo area open
10:00 -	11:00	Menominee Conference wrap-up and close.

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